



Getting Ready for the Rain

Stormwater as a Water Supply

Southern California Water Dialogue

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WATER & DROUGHT

OCTOBER 25, 2015

South state storms show no easy remedies for California drought



HIGHLIGHTS

Mudslides, floods but little drought relief

El Niño stays south, where water storage is lacking

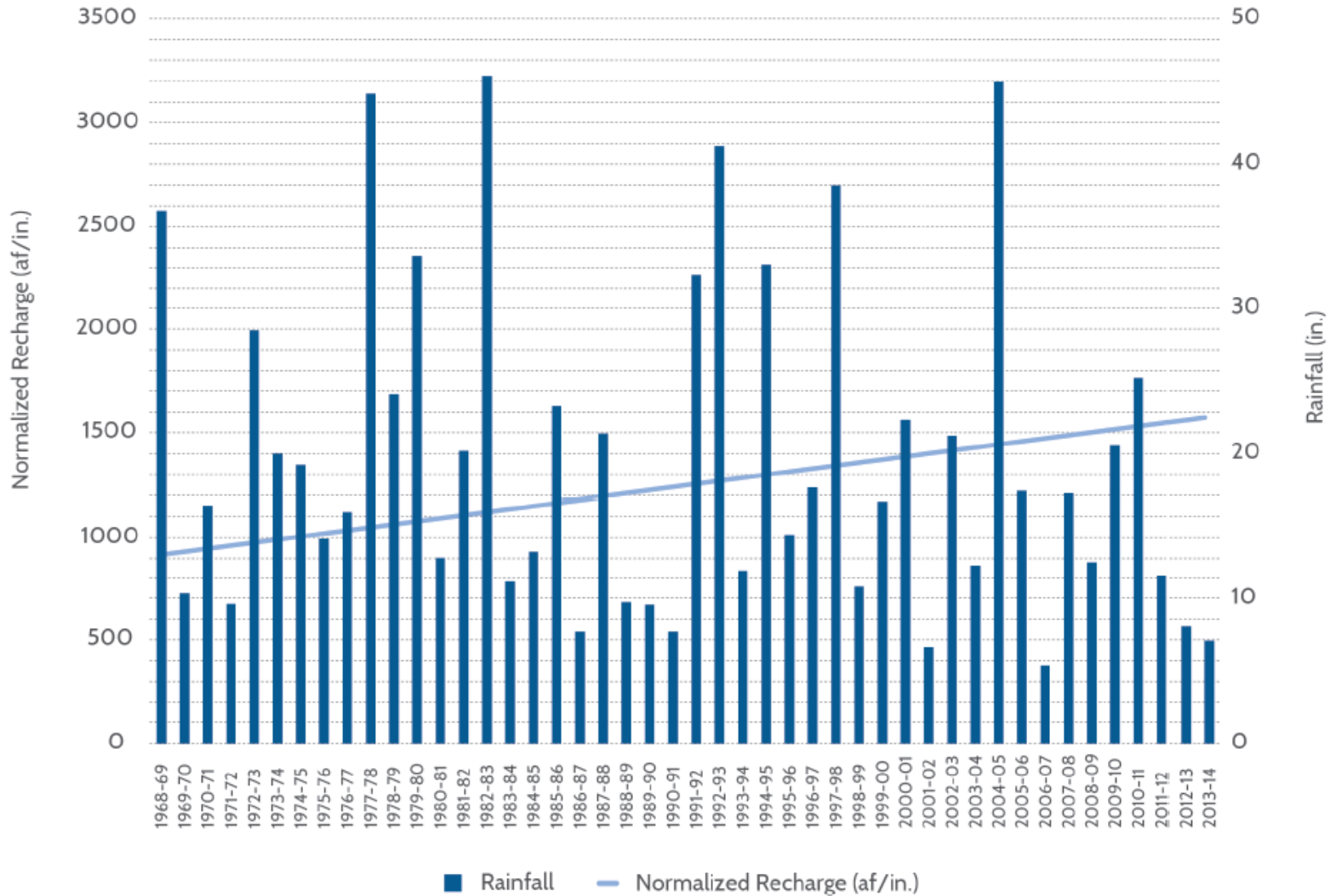
Snow in Sierra Nevada needed for long-term recovery

Alluvial Groundwater Basins and Subbasins within the South Coast Hydrologic Region



Alluvial Groundwater Basins and Subbasins within the South Coast Hydrologic Region

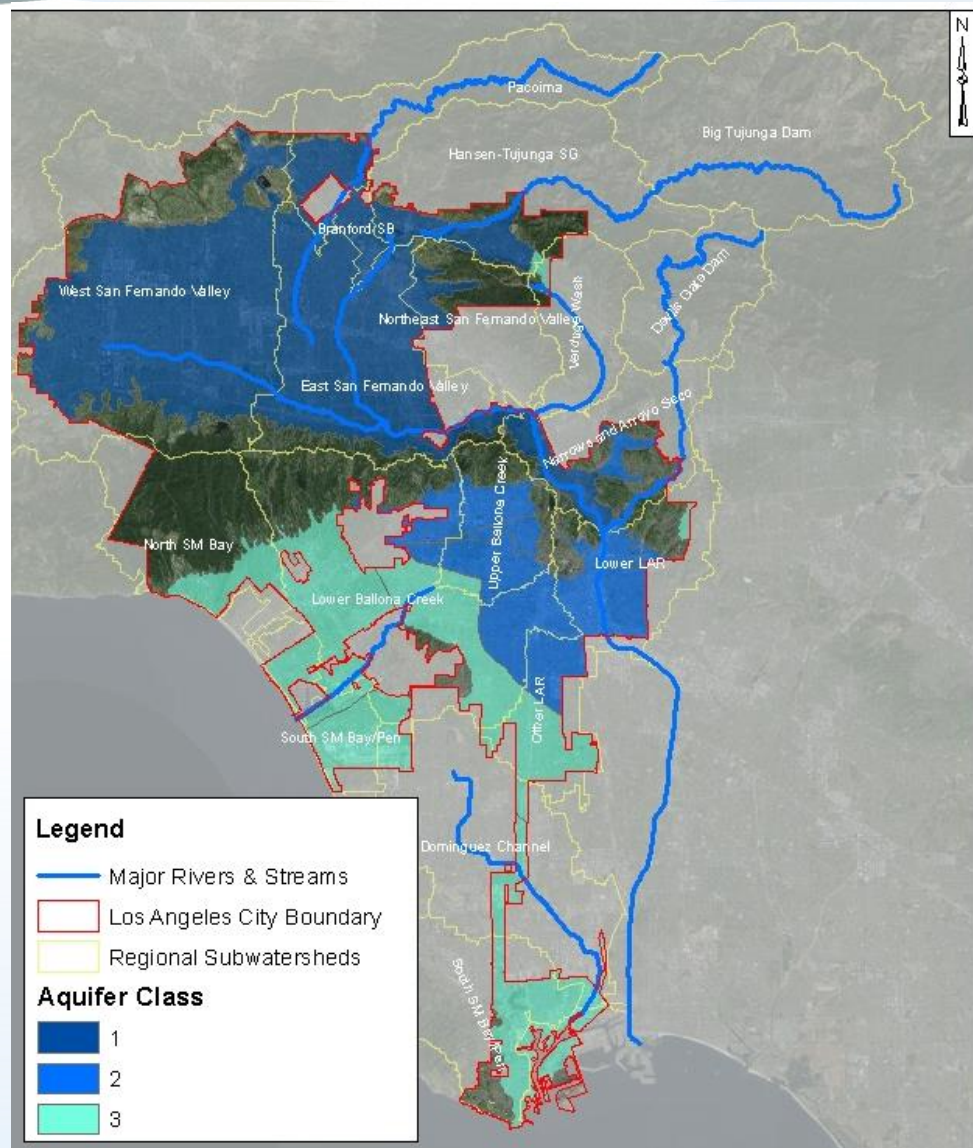
- 4-01 Upper Ojai Valley
- 4-02 Ojai Valley
- 4-03 Ventura River Valley
 - 4-03.01 Upper Ventura River
 - 4-03.02 Lower Ventura River
- 4-04 Santa Clara River Valley
 - 4-04.02 Oxnard
 - 4-04.03 Mound
 - 4-04.04 Santa Paula
 - 4-04.05 Fillmore
 - 4-04.06 Piru
 - 4-04.07 Santa Clara River Valley East
- 4-05 Acton Valley
- 4-06 Pleasant Valley
- 4-07 Arroyo Santa Rosa Valley
- 4-08 Las Posas Valley
- 4-09 Simi Valley
- 4-10 Conejo Valley
- 4-11 Coastal Plain of Los Angeles
 - 4-11.01 Santa Monica
 - 4-11.02 Hollywood
 - 4-11.03 West Coast
 - 4-11.04 Central
- 4-12 San Fernando Valley
- 4-13 San Gabriel Valley
- 4-15 Tierra Rejada
- 4-16 Hidden Valley
- 4-17 Lockwood Valley
- 4-18 Hungry Valley
- 4-19 Thousand Oaks Area
- 4-20 Russell Valley
- 4-22 Malibu Valley
- 4-23 Raymond
- 8-01 Coastal Plain of Orange County
- 8-02 Upper Santa Ana Valley
 - 8-02.01 Chino
 - 8-02.02 Cucamonga
 - 8-02.03 Riverside-Arlington
 - 8-02.04 Rialto-Colton
 - 8-02.05 Cajon
 - 8-02.06 Bunker Hill
 - 8-02.07 Yucaipa
 - 8-02.08 San Timoteo
 - 8-02.09 Temescal
- 8-04 Elsinore
- 8-05 San Jacinto
- 8-06 Hemet Lake Valley
- 8-07 Big Meadows Valley
- 8-08 Seven Oaks Valley
- 8-09 Bear Valley
- 9-01 San Juan Valley
- 9-02 San Mateo Valley
- 9-03 San Onofre Valley
- 9-04 Santa Margarita Valley
- 9-05 Temecula Valley
- 9-06 Coahuila Valley
- 9-07 San Luis Rey Valley
- 9-08 Warner Valley
- 9-09 Escondido Valley
- 9-10 San Pasqual Valley
- 9-11 Santa Maria Valley
- 9-12 San Dieguito Creek
- 9-13 Poway Valley
- 9-14 Mission Valley
- 9-15 San Diego River Valley
- 9-16 El Cajon Valley
- 9-17 Sweetwater Valley
- 9-18 Otay Valley
- 9-19 Tijuana Basin
- 9-22 Batiquitos Lagoon Valley
- 9-23 San Elijo Valley
- 9-24 Pamo Valley
- 9-25 Ranchita Town Area
- 9-27 Cottonwood Valley
- 9-28 Campo Valley
- 9-29 Potrero Valley
- 9-32 San Marcos Area



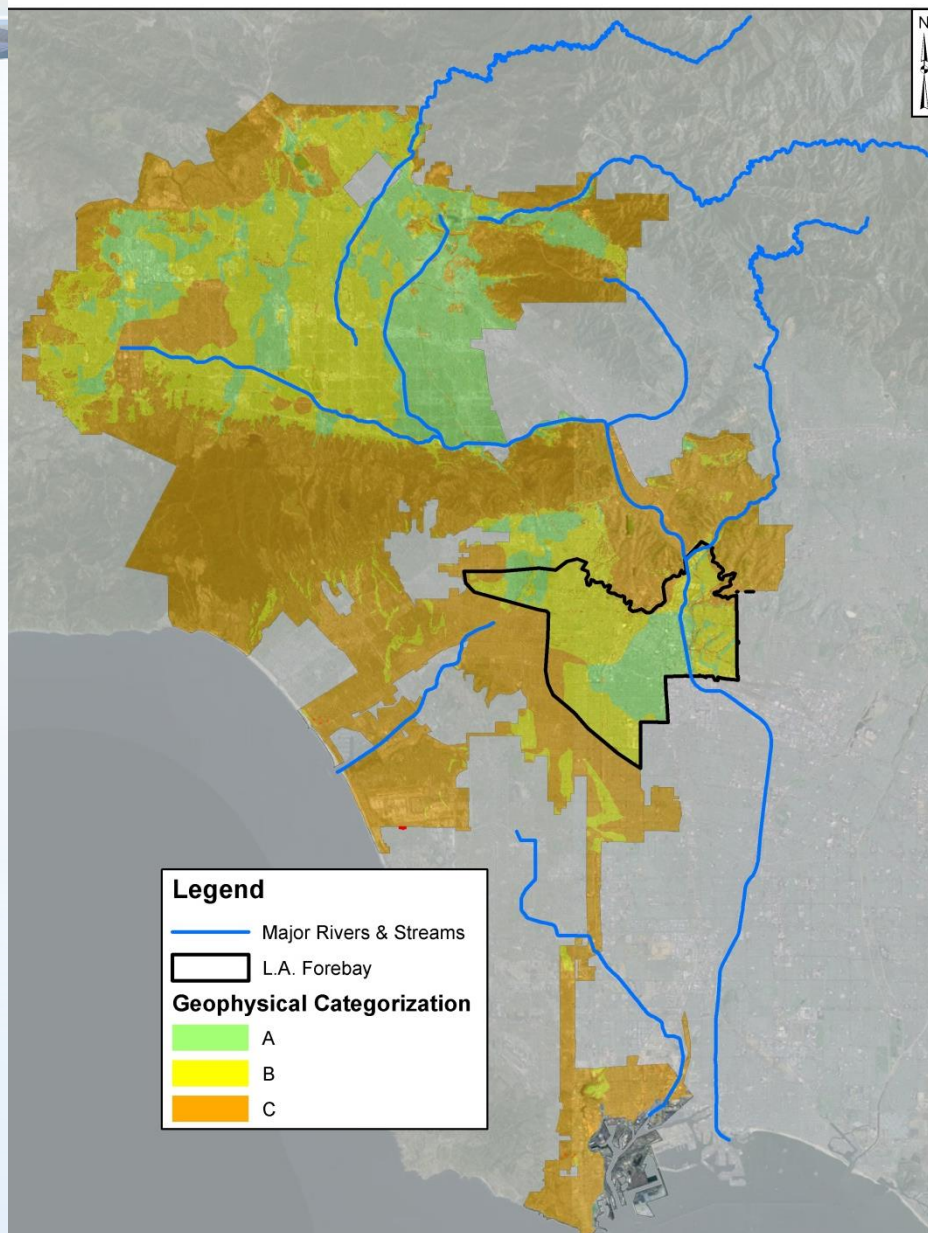
- San Fernando Basin
- Hollywood Basin
- Santa Monica Basin
- Central Basin
- West Coast Basin

Aquifer Classes

- Class 1: Under City control
- Class 2: LA Forebay
- Class 3: Perched



Prioritization-Geophysical Category



CATEGORY A

- Least hydrogeologically constrained
- Highest priority aquifers
- Conducive to infiltration BMPs

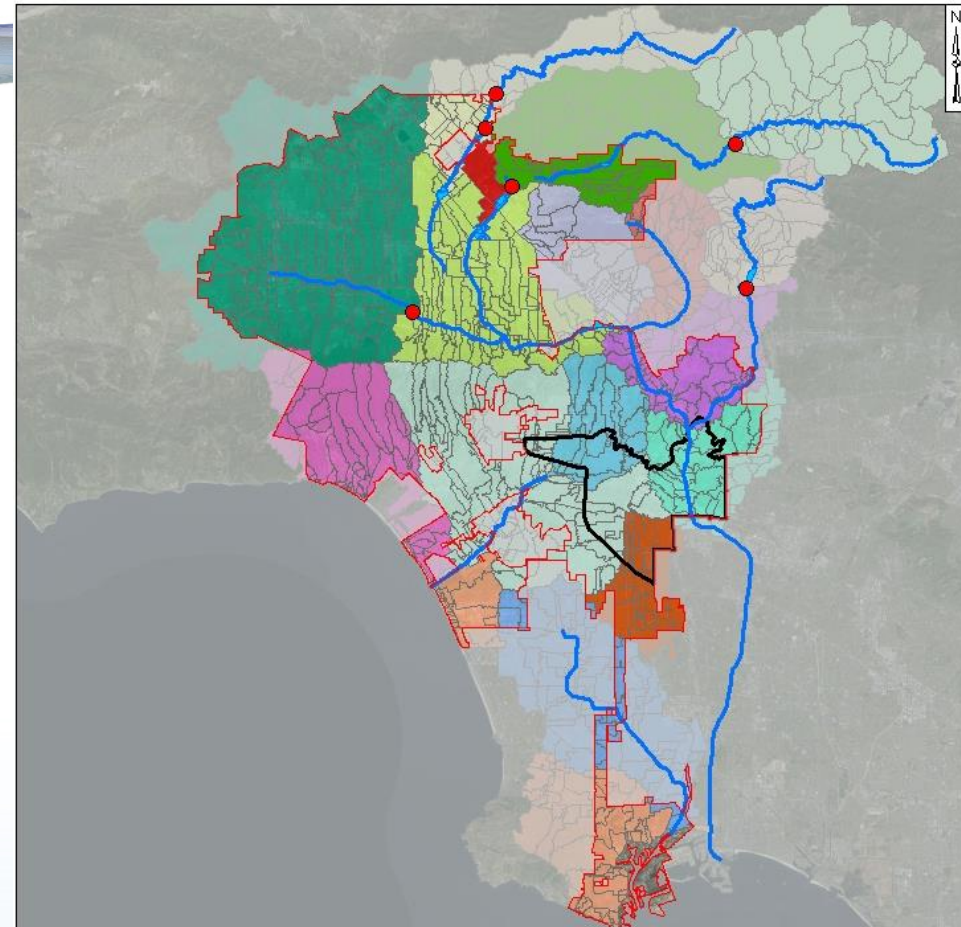
CATEGORY B

- Somewhat hydrogeologically constrained
- Mid level priority aquifers
- Conducive to infiltration BMPs

CATEGORY C

- Most hydrogeologically constrained
- Lower priority aquifers
- More advantageous for direct use BMPs

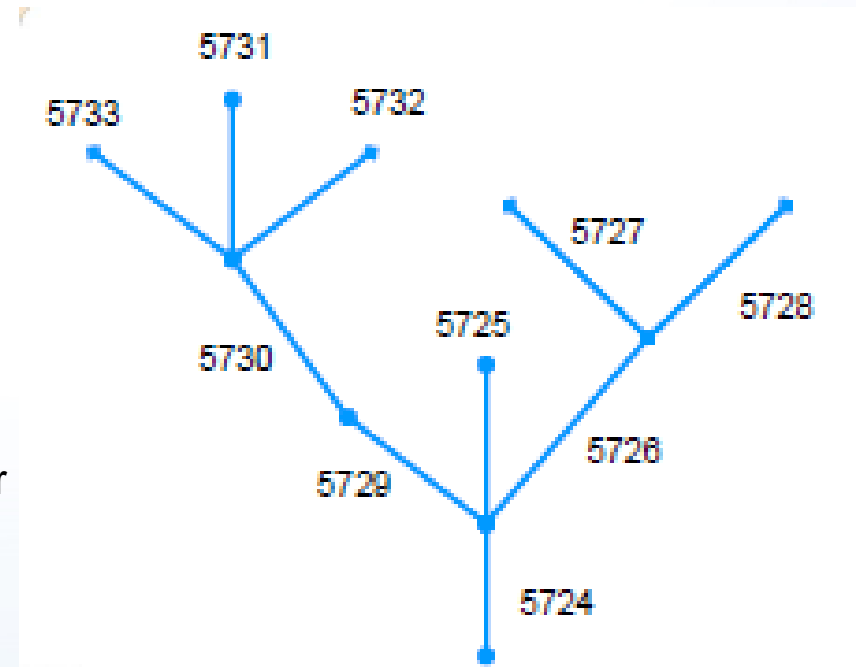
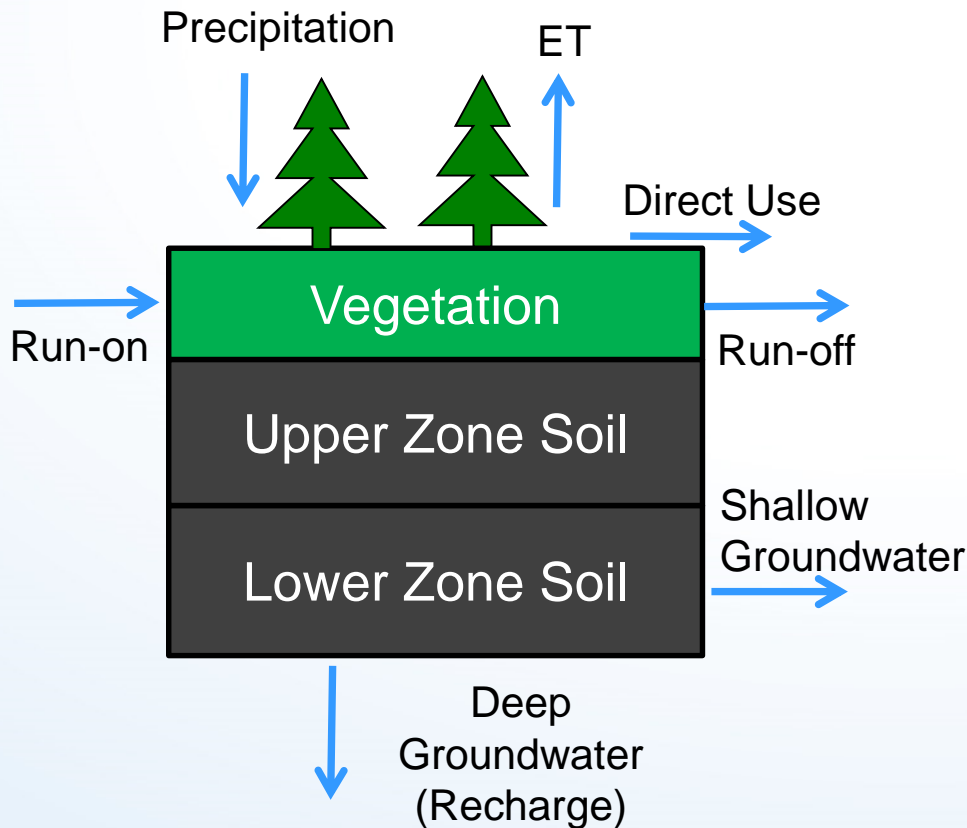
- Study area divided into 1001 subbasins group into 17 subwatersheds by
- Major watershed
- Centralized facilities
- River network
- Aquifers



Legend

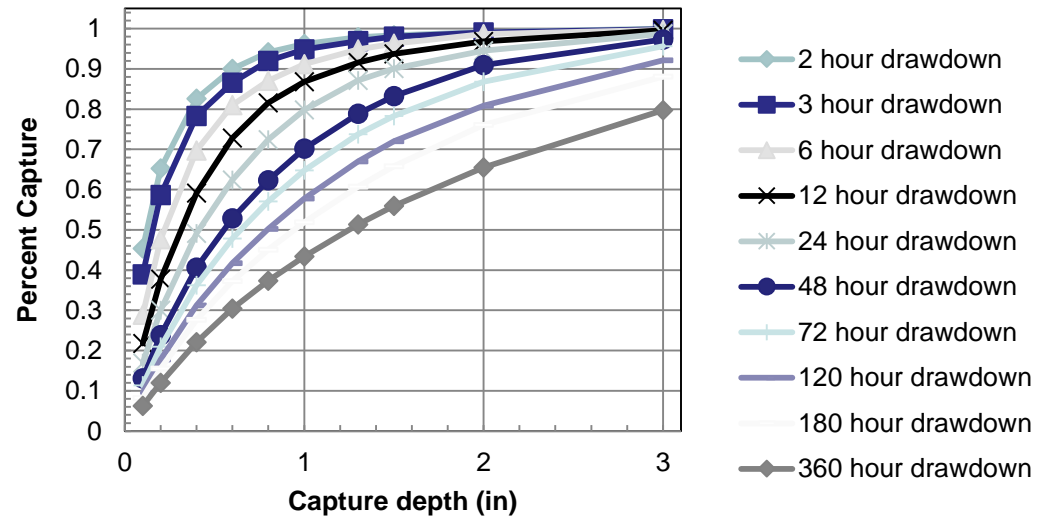
● Dams	 Lower LA River	 Branford SB
— Major Rivers & Streams	 Other LA River	 Devil's Gate Dam
☁ Spreading Grounds	 Upper Ballona Creek	 BigTujungaDam
 Los Angeles City Boundary	 Lower Ballona Creek	 Hansen Tujunga SG
 Los Angeles Forebay	 Narrows and Arroyo Seco	 West San Fernando Valley
 North SM Bay	 East San Fernando Valley	 Pacoima SG
 South SM Bay and Peninsula	 Northeast San Fernando Valley	
 Dominguez Channel	 Verdugo Wash	

Step 1: Hydrology modeling of existing condition. (LSPC/GWAM)



Step 2: Modeling of unit BMPs to develop nomographs. (LSPC)

Example: Burbank Rain Gauge



Precip / ET (71 gages)



Runoff



1 acre-impervious area

Generic BMP
(10 capture depths,
10 drawdown times)



Overflow

Capture (recharge / direct use)



Step 3: Project and program development, application throughout City, and quantification of capture

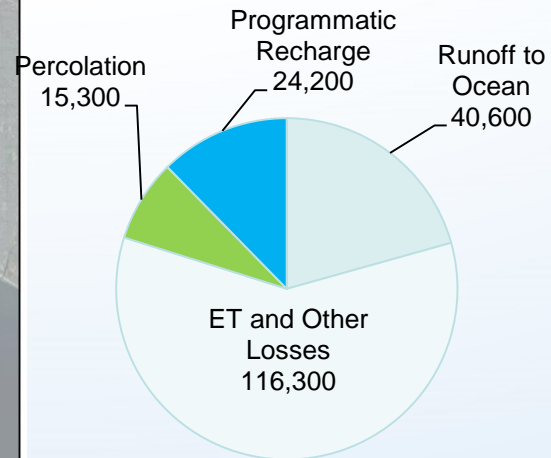
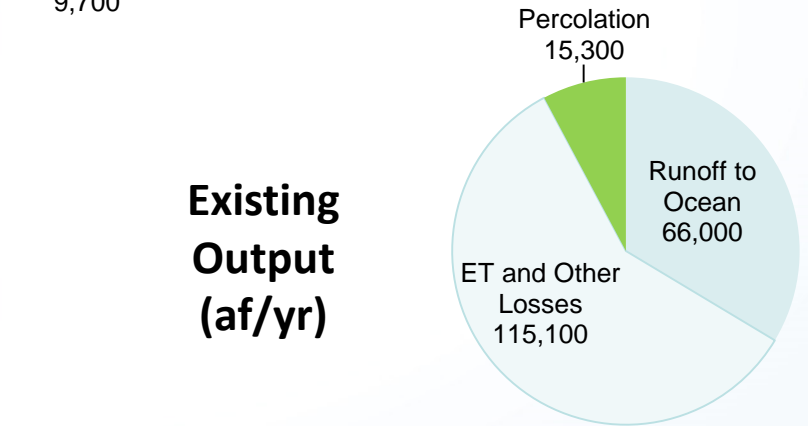
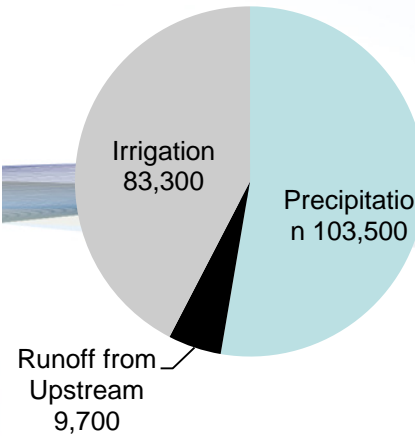
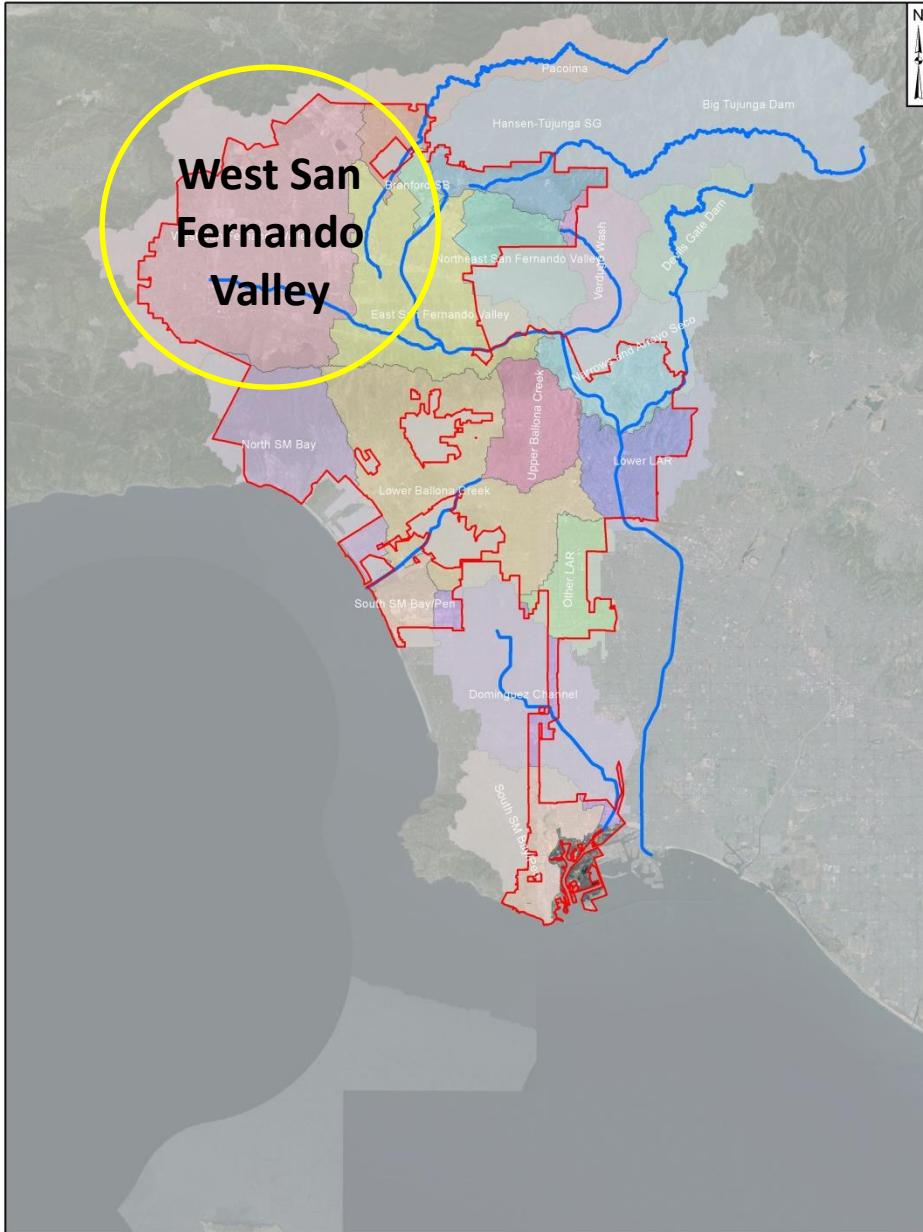
Centralized Facilities

Distributed Programs

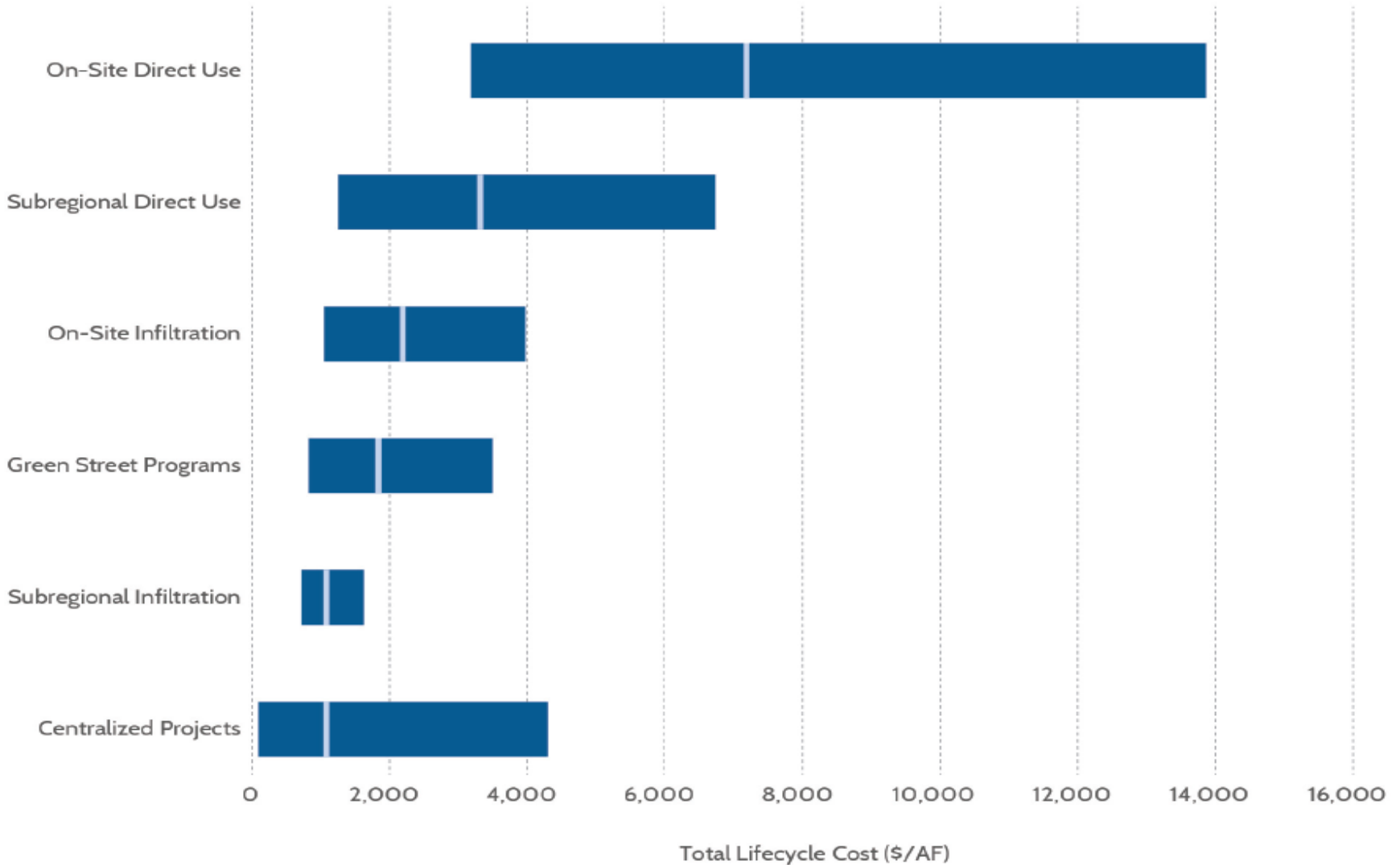


Program	Examples
On-site Infiltration	Residential Rain Garden Program
Green Streets	Commercial Green Street Program
Subregional Infiltration	Neighborhood Recharge Facility Program
On-site Direct Use	Residential or Commercial Cistern Program
Subregional Direct Use	Distributed Reservoir Program
Impervious Replacement	Impervious Surface Replacement Program

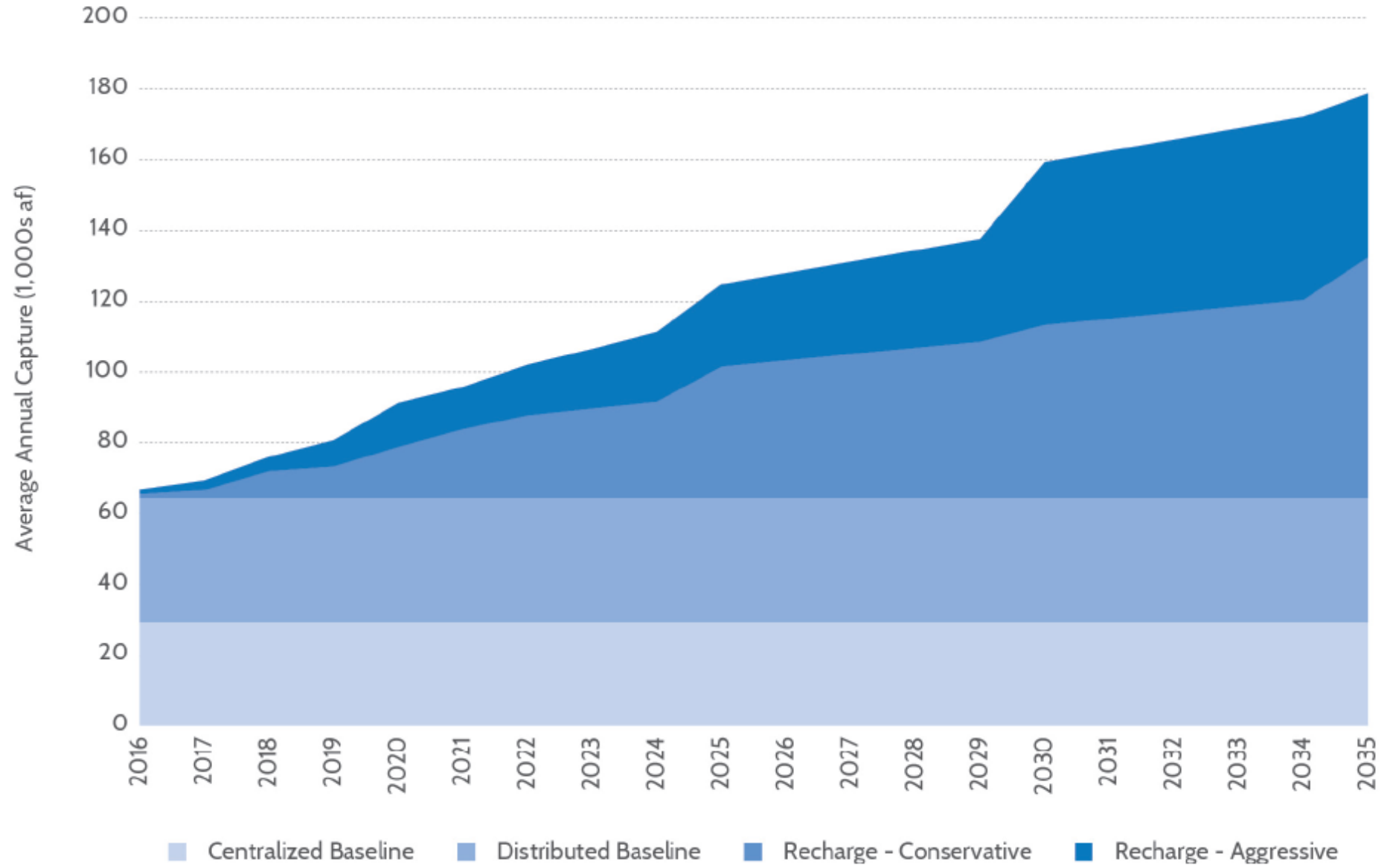
Results



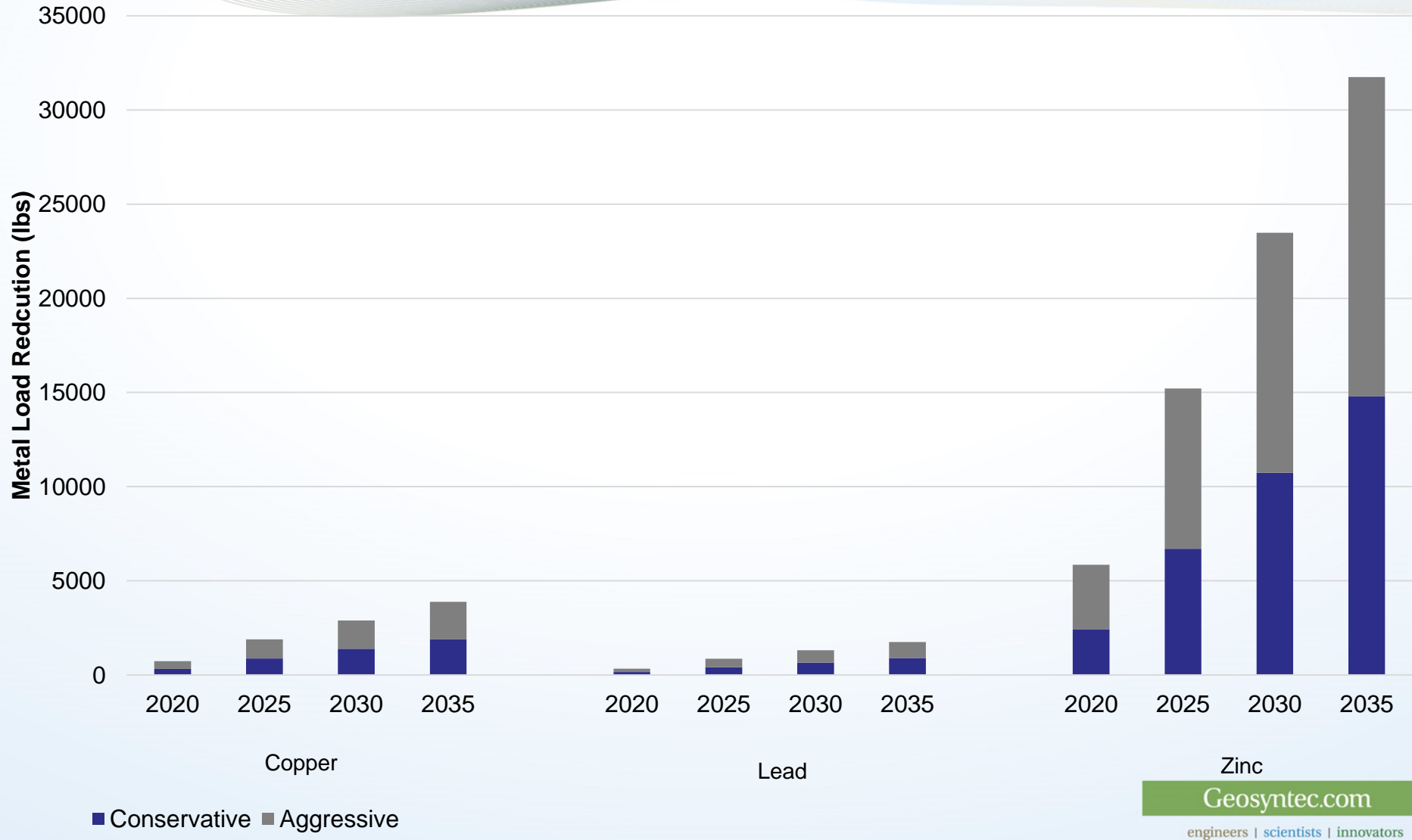
Program Cost Effectiveness



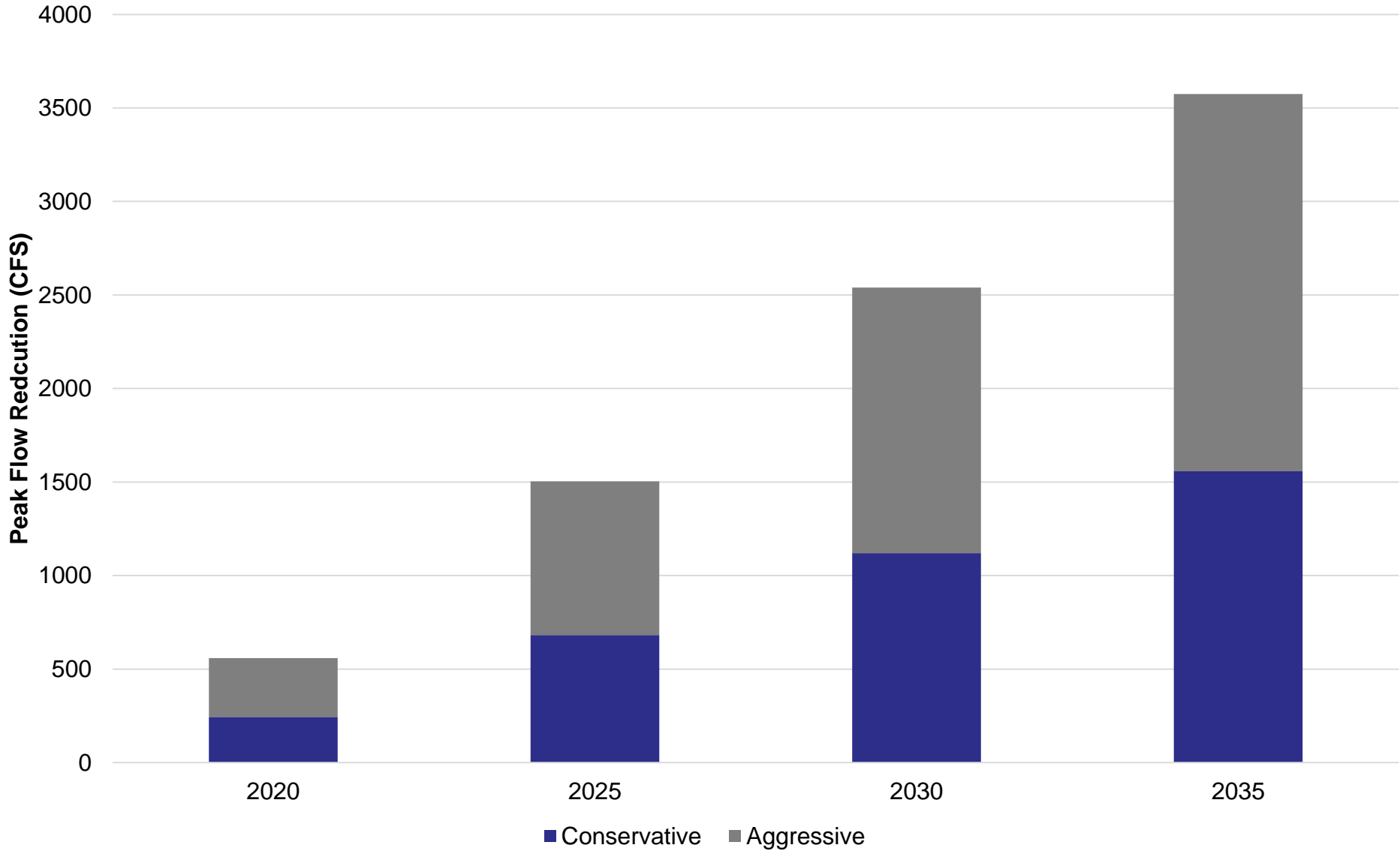
Water Supply Benefits Over Time



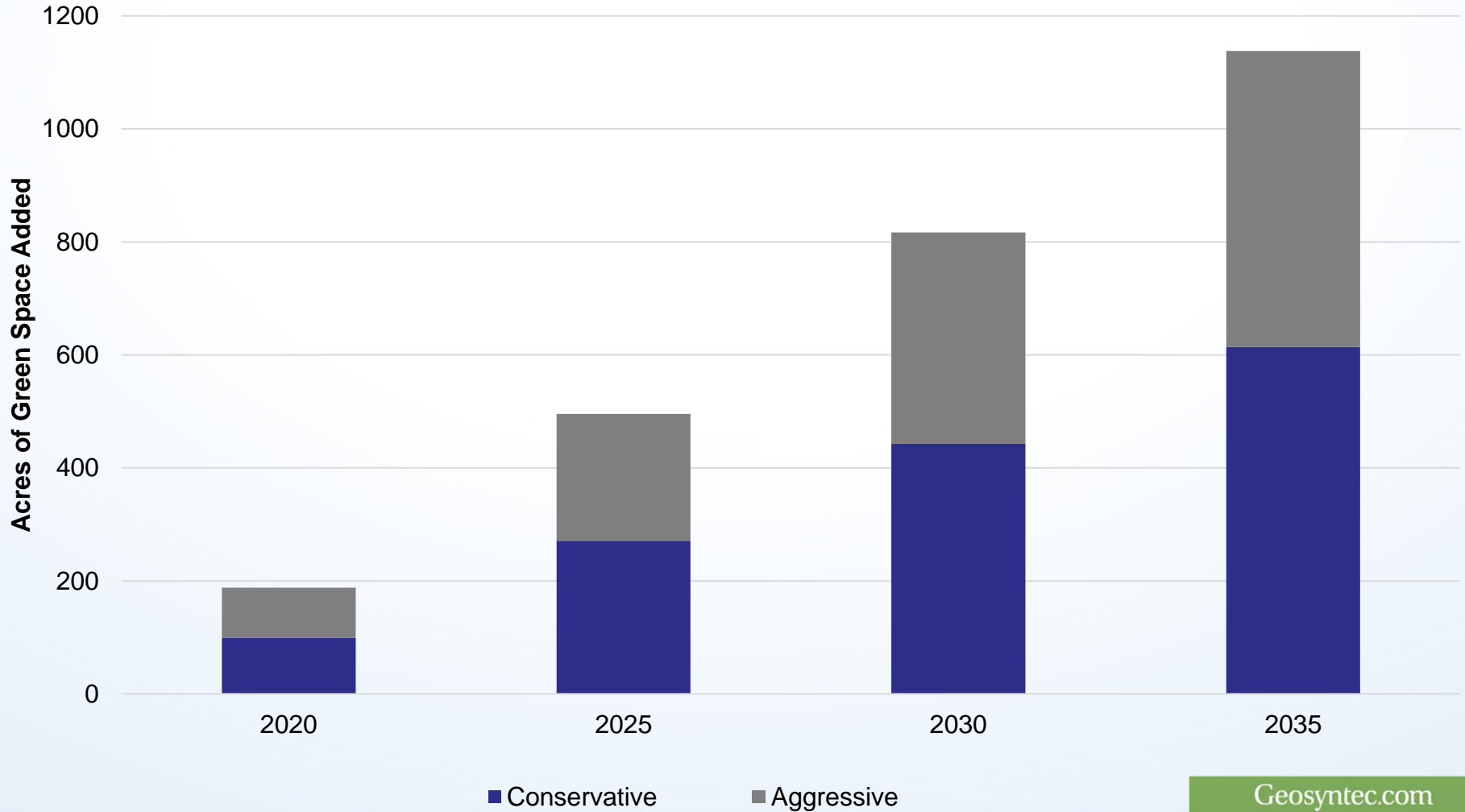
Pollutant Load Reduction



Peak Flow Reduction

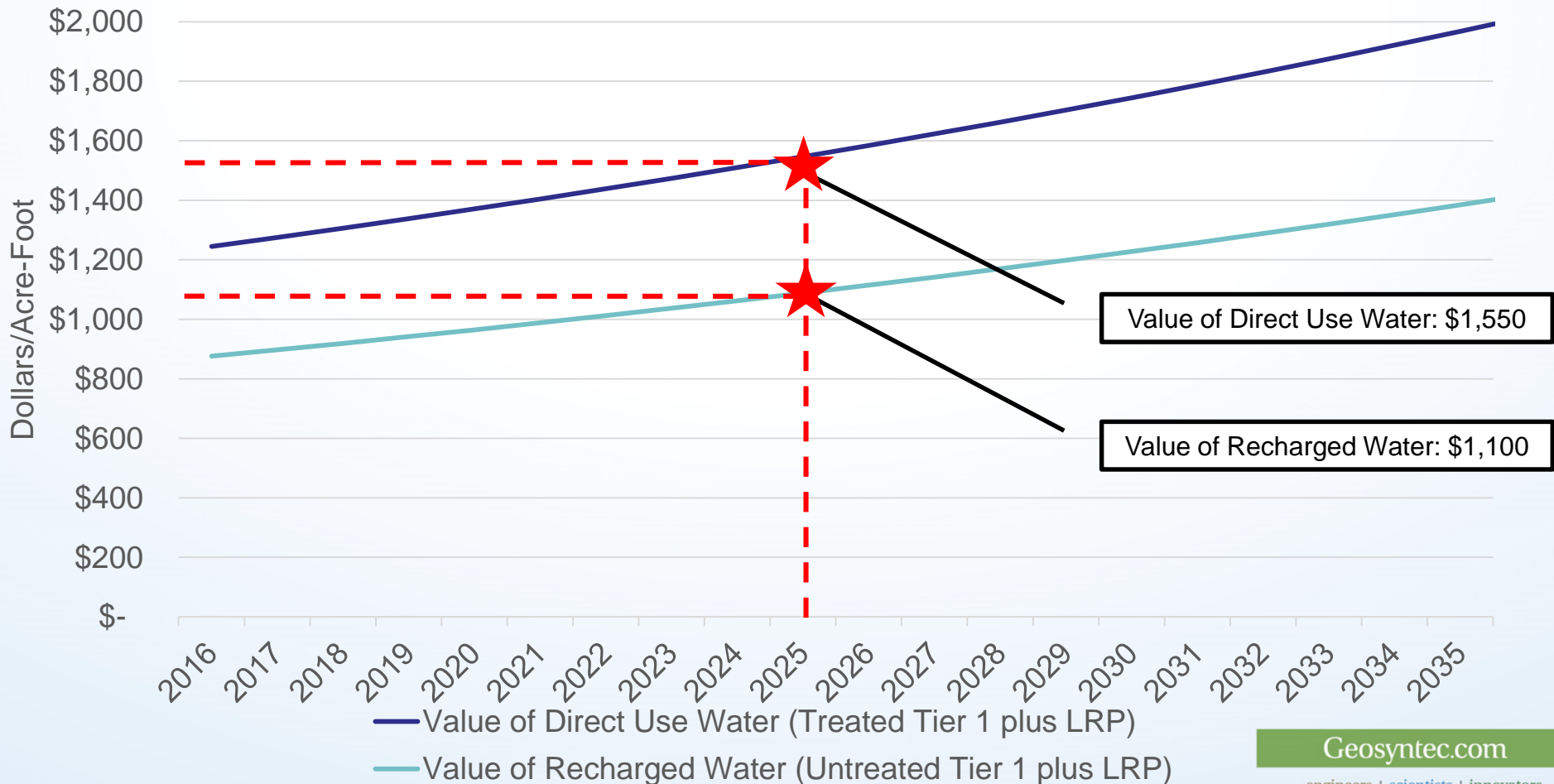


Green Space Addition



Implementation Strategies – Value of Captured Water to LADWP

Projected Cost of MWD Water



Implementation Strategies Avenues of Implementation

- LADWP-Led
- LADWP Coordination with Other Agencies and Coordination with EWMPs
- Property Owner Implementation

- Agency Financing Options
 - Agency Bonds
 - State Revolving Funds
 - Special Assessment Districts and Joint Power Authorities
 - Private Financing (P3)
- Cost Sharing
- Grant opportunities
- Customer Funded
 - Financing Options for Customers
 - PACE
 - On-Bill Financing
 - Rebates and Credits for Infiltration Projects

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